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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,096	05/31/2006	Yuji Yamada	290541US8PCT	5377
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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER MONIKANG, GEORGE C				
ART UNIT		PAPER NUMBER		
2615				
NOTIFICATION DATE		DELIVERY MODE		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/581,096

Applicant(s)

YAMADA ET AL.

Examiner

GEORGE C. MONIKANG

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 June 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☒ Certified copies of the priority documents have been received in Application No. 10/581,096.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-893)
Paper No(s)/Mail Date 2/22/2007, 5/31/2006
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 6/19/2008 have been fully considered but they are not persuasive.
2. With regards to applicant's arguments that the combined teachings of Eberbach and Fujimori fail to disclose a means for processing the input audio signal on the basis of an inverse correction characteristic corresponding to an overall impulse response of the speaker system (Fujimori, col. 6, lines 40-50), the shift being caused by the relative physical locations of the respective drive surfaces (Fujimori, col. 6, lines 40-50: the positions of the right & left loudspeakers of the headphones), the examiner maintains his grounds for rejection. Fujimori as stated above discloses an inverse crosstalk correction to left and right loudspeakers which is determined by the location of the loudspeakers relative to each other and the listener.
3. With regards to applicant's arguments that the combined teachings of Eberbach and Fujimori fail to disclose a frequency divider, the examiner maintains his stand. Eberbach discloses a frequency divider (Eberbach, fig. 2: 28)

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. Claims 1-2, 4-9, 13 & 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eberbach, US Patent 4,885,782, in view of Fujimori, US Patent 6,026,169.

4. Re Claim 1, Eberbach discloses an audio signal processing apparatus adapted for delivering an audio signal to a speaker system comprising a frequency dividing filter outputting portions of a single input thereto as separate frequency components (*Eberbach, fig. 2: 28*); at least two drive units or more which are divided or separated by frequency band receiving the separate frequency components output from the frequency dividing filter (*Eberbach, fig. 2: 28; col. 3, lines 34-49*); the input audio signal being processed to compensate for a shift between phases of respective sound waves radiated from respective drive surfaces of the at least two drive units of the speaker system (*Eberbach, fig. 2; col. 3, lines 34-49*), but fails to disclose a filter means for processing the input audio signal on the basis of an inverse correction characteristic corresponding to an overall impulse response of the speaker system (*Fujimori, col. 6, lines 40-50*), the shift being caused by the relative physical locations of the respective

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drive surfaces (Fujimori, col. 6, lines 40-50: the positions of the right & left loudspeakers of the headphones). However, Fujimori does.

5. Taking the combined teachings of Eberbach and Fujimori as a whole, one skilled in the art would have found it obvious to modify the processing apparatus adapted for delivering an audio signal to a speaker system comprising a frequency dividing filter outputting portions of a single input thereto as separate frequency components (Eberbach, fig. 2: 28); at least two drive units or more which are divided or separated by frequency band receiving the separate frequency components output from the frequency dividing filter (Eberbach, fig. 2: 28; col. 3, lines 34-49); the input audio signal being processed to compensate for a shift between phases of respective sound waves radiated from respective drive surfaces of the at least two drive units of the speaker system (Eberbach, fig. 2; col. 3, lines 34-49) of Eberbach with a filter means for processing the input audio signal on the basis of an inverse correction characteristic corresponding to an overall impulse response of the speaker system (Fujimori, col. 6, lines 40-50), the shift being caused by the relative physical locations of the respective drive surfaces (Fujimori, col. 6, lines 40-50: the positions of the right & left loudspeakers of the headphones) as taught in Fujimori to output sounds across a broad frequency range.

Re Claim 2, the combined teachings of Eberbach and Fujimori disclose the audio signal processing apparatus as set forth in claim 1, wherein the at least two drive units include a drive unit for reproducing a signal at a high frequency band and a drive unit for reproducing a signal at a low frequency band (Eberbach, fig. 2; col. 3, lines 34-49) and

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are coaxially disposed with respect to acoustic center (Eberbach, fig. 1; col. 3, lines 22-33).

Re Claim 4, Eberbach discloses an audio signal processing apparatus adapted for delivering an audio signal to a speaker system comprising: a frequency dividing filter outputting portions of a single input thereto as separate frequency components (Eberbach, fig. 2: 28); at least two drive units-which are divided or separated by frequency band receiving the separate frequency components output from the frequency dividing filter (Eberbach, fig. 2: 28; col. 3, lines 34-49); the input audio signal being processed to compensate for a shift between phases of respective sound waves radiated from respective drive surfaces of the at least two drive units of the speaker system (Eberbach, fig. 2: col. 3, lines 34-49), but fails to disclose a first filter means having a predetermined arbitrary transmission characteristic (Fujimori, col. 7, lines 10-13; col. 8, lines 25-30) and second filter means having an inverse correction characteristic corresponding to an overall impulse response of the speaker system (Fujimori, col. 6, lines 40-50) the shift being caused by the relative physical locations of the respective drive surfaces (Fujimori, col. 6, lines 40-50: the positions of the right & left loudspeakers of the headphones). However, Fujimori does.

Taking the combined teachings of Eberbach and Fujimori as a whole, one skilled in the art would have found it obvious to modify the audio signal processing apparatus adapted for delivering an audio signal to a speaker system comprising: a frequency dividing filter outputting portions of a single input thereto as separate frequency components (Eberbach, fig. 2: 28); at least two drive units-which are divided or

separated by frequency band receiving the separate frequency components output from the frequency dividing filter (Eberbach, fig. 2: 28; col. 3, lines 34-49); the input audio signal being processed to compensate for a shift between phases of respective sound waves radiated from respective drive surfaces of the at least two drive units of the speaker system (Eberbach, fig. 2: col. 3, lines 34-49) with a first filter means having a predetermined arbitrary transmission characteristic (Fujimori, col. 7, lines 10-13; col. 8, lines 25-30) and second filter means having an inverse correction characteristic corresponding to an overall impulse response of the speaker system (Fujimori, col. 6, lines 40-50) the shift being caused by the relative physical locations of the respective drive surfaces (Fujimori, col. 6, lines 40-50: the positions of the right & left loudspeakers of the headphones) as taught in Fujimori to output sounds across a broad frequency range.

Re Claim 5, the combined teachings of Eberbach and Fujimori disclose the audio signal processing apparatus as set forth in claim 4, wherein transmission characteristic of the first filter means is a frequency characteristic in which group delay characteristic is constant (Fujimori, fig. 5: col. 7, lines 10-13; col. 8, lines 25-30).

Re Claim 6, the combined teachings of Eberbach and Fujimori disclose the audio signal processing apparatus as set forth in claim 4, wherein transmission characteristic that the first filter means has is characteristic for conducting a control such that sound image localization position in the case where an input audio signal is reproduced by plural speakers results in an arbitrary position (Fujimori, col. 6, lines 40-50).

Claims 7 & 8 have been analyzed and rejected according to claim 6.

Re Claim 9, the combined teachings of Eberbach and Fujimori disclose the audio signal processing apparatus as set forth in claim 8, wherein the electro-acoustic transducer is a speaker or headphone system (*Fujimori, col. 6, lines 40-50*).

Claim 13, the combined teachings of Eberbach and Fujimori disclose the audio signal processing apparatus as set forth in claim 8, wherein the electro-acoustic transducer is an audio amplifier (*Fujimori, fig. 14: 12; col. 6, lines 40-60*).

Claim 16 has been analyzed and rejected according to claim 1.

Claim 17 has been analyzed and rejected according to claim 4.

1. Claims 3, 12 & 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eberbach, US Patent 4,885,782 and Fujimori, US Patent 6,026,169 as applied to claim 1 above, in view of Yamada et al, US Patent 5,757,931.
2. Re Claim 3, Eberbach and Fujimori disclose the audio signal processing apparatus as set forth in claim 1, but fail to disclose where the filter means is an FIR filter. However, Yamada does as taught in Yamada et al (*abstract*).
3. Taking the combined teachings of Eberbach, Fujimori and Yamada as a whole, one skilled in the art would have found it obvious to modify the audio signal processing apparatus of Eberbach and Fujimori with where the filter means is an FIR filter as taught in Yamada et al (*abstract*) to filter digital signals.
- 4.

Re Claim 12, Eberbach and Fujimori disclose the audio signal processing apparatus as set forth in claim 8, with where the electro-acoustic transducer is an

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adding unit as taught in Yamada et al (Yamada et al, fig. 7: 77 & 78) for cross cancellation.

5. Claim 14, Eberbach and Fujimori disclose the audio signal processing apparatus as set forth in claim 4, with wherein the first filter means adds, to the input audio signal, an impulse response characteristic which has been selectively switched among impulse response characteristics of plural kinds of electro-acoustic transducers as taught in Yamada et al (Yamada et al, fig. 4: 44, 48, 51 & fig. 6: 66) to extend the impulse response time.

Claim 15, the Eberbach and Fujimori disclose the audio signal processing apparatus as set forth in claim 4, with wherein the first filter means and the second filter means are FIR filters as taught in Yamada et al (Yamada et al, fig. 4: 44, 48, 51) to filter digital signals.

6. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eberbach, US Patent 4,885,782 and Fujimori, US Patent 6,026,169 as applied to claim 8 above, in view of Packard, US Patent 7,035,417 B1.

Re Claim 10, Eberbach and Fujimori disclose the audio signal processing apparatus as set forth in claim 8, but fail to disclose where an electro-acoustic transducer is a record needle. However, Packard does (Packard, col. 10, lines 1-17).

Taking the combined teachings of Eberbach, Fujimori and Packard as a whole, one skilled in the art would have found it obvious to modify the audio signal processing apparatus of Eberbach and Fujimori with where an electro-acoustic transducer is a

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record needle as taught in Packard (*Packard, col. 10, lines 1-17*) to be able to implement the system with record players.

7. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Eberbach, US Patent 4,885,782 and Fujimori, US Patent 6,026,169 as applied to claim 8 above, in view of Hirade et al, US Patent 7,119,267 B2.

Re Claim 11, Eberbach and Fujimori disclose the audio signal processing apparatus as set forth in claim 8, but fail to disclose where an electro-acoustic transducer is a record recording/reproducing device. However, Hirade et al does (*Hirade et al, col. 2, lines 41-52*).

Taking the combined teachings of Eberbach, Fujimori and Hirade as a whole, one skilled in the art would have found it obvious to modify the audio signal processing apparatus of Eberbach and Fujimori with where an electro-acoustic transducer is a record recording/reproducing device as taught in Hirade et al (*Hirade et al, col. 2, lines 41-52*) to be able to implement the system with CD/portable players.

Contact

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GEORGE C. MONIKANG whose telephone number is (571)270-1190. The examiner can normally be reached on M-F. alt Fri. Off 7:30am-5:00pm (est).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chin Vivian can be reached on 571-272-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/George C Monikang/
Examiner, Art Unit 2615

7/3/2008

/Vivian Chin/
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